

7. (twice amended) The fluidized-bed reactor as claimed in claim 6, wherein the filter elements coordinated with the bypass stream have a pore size differing from that of the fine dust filter cartridges for the controlled passage of fine dust fractions.

10. (amended) The process of claim 1, wherein said process is used primarily for oxychlorination of ethylene.

11. (amended) The process of claim 10, wherein said cartridges are sintered metal filter cartridges.

REMARKS

This is in response to the Office Action of May 20, 2002 (a Petition for a Three Month Extension of Time is enclosed) , in which the Examiner:

- a) objected to the drawings;
- b) objected to the specification;
- c) objected to the claims;
- d) rejected the claims under Section 112;
- e) rejected claim 5 as anticipated by Dengen U.S. Patent No. 2,548,875; and
- f) rejected claims 1-4 and 6-12 as obvious over Dengen in view of other references.

Based on the above amendments and following remarks, the application is deemed to be in condition for allowance and action toward that end is respectfully requested.

I. THE OBJECTION TO THE DRAWINGS SHOULD BE WITHDRAWN

Claims 1 and 9 were objected to as the drawing did not show a "quench" or "a cleaning means." Submitted herewith, along with a Letter to the Official Draftsperson, is revised Figure 1 indicating that the "quench" is downstream the main stream and that gas pulses are on the baseplate.

The drawings were also objected to as showing the element of 1α , which was not explained in the specification. The intent of the reference was simply the numeral 1 and not 1α . The α symbol has been proposed to the Official Draftsperson to be deleted.

In view of the above, the objection to the drawings should be withdrawn.

III. THE OBJECTION TO THE SPECIFICATION SHOULD BE WITHDRAWN

The specification was objected to and certain insertions were requested by the Examiner at pages 6 and 7 of the specification. Such insertions have now been made and the objections to the specification should therefore be withdrawn.

IV. THE OBJECTION TO THE CLAIMS SHOULD BE WITHDRAWN

The requested changes to the claims have been made. Accordingly, the objection to the claims should be withdrawn.

V. THE REJECTION IN VIEW OF THE REFERENCE SHOULD BE WITHDRAWN

As explained, the claims were found to be unpatentable over the Degnen and other references. As demonstrated herein, this is not so.

The object of the present invention is the exclusion of fine dust particles from a fluidized-bed reactor where a filter apparatus, generally comprising a baseplate with filter elements arranged thereon, is present inside the reactor to prevent the discharge of catalyst particles. In particular, an object of the application is the exclusion of fine dust particles from fluidized-bed reactors having bubble-forming fluidized beds.

Present-day filter elements retain not only the intact catalyst particles, but also abrasion particles which, owing to their small size and irregular shape, would lead to deterioration in the fluidization and heat transfer properties of the fluidized bed if they accumulated inside the reactor. If, for example, in the oxychlorination of ethylene, the entire catalyst bed is not regularly exchanged but only losses are replaced, such undesired accumulation of fine catalyst dust particles may occur.

The present invention remedies this by connecting, in parallel with the regular fine-pore or fine-meshed filter elements, more coarse-meshed or coarse-pore filter elements which, because of their coarser mesh size or pore size, retain the desired catalyst particles, but allow through the finer abrasion particles. The proportion of undesired fine dust particles in the fluidized bed can be regulated by setting up a continuous or discontinuous bypass stream through these coarser filter elements.

The *Degen* patent describes an arrangement in which filter elements are arranged on a baseplate. A particular feature is that the filter elements dip into the fluidized bed to remove the resulting filter cake by the fluidization movement of the fluidized bed without cleaning, for example, by back-flushing with a purge gas. Degen however does not disclose, teach or

otherwise suggest the method described above for regulating the fine dust content in the fluidized bed.

Take Raterman '937 patent also does not disclose, teach or otherwise suggest the same method as described and claimed in the present application. Raterman rather describes an arrangement of cyclones in a fluidized-bed reactor which retain catalyst particles and allow through fine dust particles.

The Cheng '888 patent discloses a specific method for cleaning filters in which the filter housing is divided into a plurality of compartments. These filters however do not vary in fineness as described in the present invention. Cheng also does not disclose, teach or otherwise suggest the controlled exclusion of fine dust. Finally, Cheng does not even relate to the use in fluidized-bed reactors.

The Smith patent describes the use of filters of different fineness in the filtration of oil in an automatic gear. Even though "partial flow filter system" appears in the title, we are unable to discern what this reference has to do with the control of the amount of fine dust in the fluidized-bed reactor.

The *Daw* '972 patent describes a method for analyzing the fluidization behavior of a fluidized bed. That the composition (e.g. the particle size distribution) or even the fluidization behavior has to be monitored in some way is clear to one skilled in the art. However Daw does not disclose, teach or otherwise suggest the present application for establishing the fluidized bed composition (the apparatus described here for measuring the fluidization of the fluidized bed ("turbulence")) acts on the amount of fluidizing gas).

The Shah '353 patent teaches the use of sintered metal filter elements for retaining fine dust in a reactor exit gas and the cleaning of said filter elements by back-flushing with a purge gas and has nothing in common with the method described in the present application.

The Tsao '650 patent describes the deposition of vaporized salts from a salt melt reactor onto the particles of a downstream fluidized bed, which also serves for cooling the reactor exit gas. The salt is then recovered from this fluidized bed and recycled to the reactor. Tsao does not disclose, teach or otherwise suggest the invention disclosed and claimed herein.

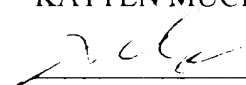
In view of the above, it is clear that the above references do not disclose, teach or otherwise suggest the invention recited in independent claims 1 and 5.

Each remaining claim is dependent, directly or indirectly on independent claims 1 or 5 and is also allowable for at least the same reasons.

CONCLUSION

In view of the above, the application is deemed to be in condition for allowance and action to that end is respectfully requested.

Respectfully submitted,
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APPENDIX – SPECIFICATION & CLAIMS IN “MARKED-UP” FORM

SPECIFICATION

Please amend the paragraph at page 6, lines 18-22 as shown below:

In the example of Fig. 1, the fluidized-bed reactor 1 has, in its dome denoted by 3, a dome plate 4 or baseplate which carries a multiplicity of filter cartridges 5 which point toward the fluidized bed 2 and, depending on the design, can optionally also dip into the fluidized bed 2.

Please amend the paragraph at page 7, lines 4-9 as below:

A corresponding gas stream comprising fine dust particles is fed via a bypass line 8 or bypass stream, for example to an external fine dust filter 9, and the fine dust can then be discharged and disposed of, which is indicated by a container 10, and the gas can then be fed via the bypass line 8 back to the main stream, denoted by 11.

CLAIMS

Claims 4, 6, 7, 10 and 11 are amended as shown below:

4. (twice amended) The process as claimed in claim 1, further comprising the steps of: analyzing a catalyst sample and/or a change in the heat transfer and/or a deterioration of the fluidization behavior; and switching on or off the bypass stream according to said [analysis] analyzing.

6. (twice amended) The fluidized-bed reactor as claimed in claim 5, wherein the dome space is divided, above the [plate] baseplate carrying the filter cartridges on its lower surface,

into at least two chambers, each having an outlet for a main stream to the quench and a bypass stream.

7. (twice amended) The fluidized-bed reactor as claimed in claim 6, wherein the filter elements coordinated with the bypass stream have a pore size differing from that of the fine dust filter cartridges for the controlled passage of fine dust fractions.

10. (amended) The process of claim 1, wherein said process is used primarily for [the] oxychlorination of ethylene.

11. (amended) The process of claim 10, wherein said cartridges are sintered metal filter cartridges.